

captioned application.

1. Rejection of Claims 1-10 and 12-14
under 35 U.S.C. §103(a)

The Office Action rejects claims 1-10 and 12-14 under 35 U.S.C. §103(a) as being unpatentable over US Patent 3,475,369 ("Blunt") in view of either US Patent 3,328,368 ("Roberts et al.") or US Patent 5,252,677 ("Tomita et al."). The Office Action states:

Blunt discloses a composition composed of a dispersion of a particulate crystalline ethylene-higher (i.e. ≥ 6 C) olefin copolymer dispersed in an e.g. aromatic hydrocarbon (e.g. toluene) solvent, which composition finds utility as a coating and/or adhesive material (i.e. exhibits adhesive affinity) for e.g. metal, plastic and cellulosic substrate materials. (Abstract, column 1, lines 23-25, column 2 lines 3-19, N.B. column 3 lines 43-51, column 4 lines 1-4, column 5 lines 23-24, column 6 lines 28-36, column 11 lines 1-35, column 12 lines 27-34).

Roberts et al. (column 1 lines 10-51 and 57-62, column 3 lines 10-15, column 7 lines 48-70) and Tomita et al. (Abstract, column 2 line 59 thru column 3 line 4, column 3 line 62 thru column 4 line 13, column 11 lines 49-60) both disclose that it is known to improve the properties (e.g. adhesiveness etc.) of olefin copolymers of the type documented in Blunt via the functionalization thereof i.e. by the incorporation (e.g. by grafting) of a polar monomer into the (preformed) copolymer, such that it would have been obvious to one of ordinary skill in this art to employ such a conventional functionalization technique for

its documented beneficial function and result (viz. adhesion improvement) in/in conjunction with the (adhesive) olefin copolymers of Blunt, wherever deemed desirable and/or necessary, and which modified (i.e. functionalized) copolymers would apparently possess and exhibit the properties and characteristics claimed.

Applicants respectfully traverse this rejection because the Office Action fails to establish all three prongs necessary for a *prima facie* case of obviousness. In particular, none of the cited references alone or in combination teach and every claimed limitation. Moreover, one of ordinary skill in the art would not have had any motivation or suggestion to make the particularly claimed ethylene/ α -olefin random copolymers in a resin dispersion.

Turning to the rule, the Federal Circuit held that a *prima facie* case of obviousness must establish: (1) some suggestion or motivation to modify the references; (2) a reasonable expectation of success; and (3) that the prior art references teach or suggest all claim limitations. Amgen, Inc. v. Chugai Pharm. Co., 18 USPQ2d 1016, 1023 (Fed. Cir. 1991); In re Fine, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988); In re Wilson, 165 USPQ 494, 496 (C.C.P.A. 1970).

A *prima facie* case of obviousness must also include a showing of the reasons why it would be obvious to modify the references to produce the present invention. See Ex parte Clapp, 277 USPQ 972,

973 (Bd. Pat. App. & Inter. 1985). The Examiner bears the initial burden to provide some convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings. Id. at 974.

Even if a *prima facie* case of obviousness has been established, secondary considerations such as commercial success, long felt but unsolved need, failure of others, and unexpected results may nevertheless give rise to a patentable invention. Graham v. John Deere Co., 148 U.S.P.Q. 459 (1966). For example, evidence such as superiority in a property the compound shares with the prior art can rebut a *prima facie* case of obviousness. See In re Chupp, 816 F.2d 643, 646, 2 USPQ2d 1437, 1439 (Fed. Cir. 1987).

In the present application, claim 1 recites a resin dispersion comprising solid particles of a graft modified ethylene/ α -olefin random copolymer dispersed in an organic solvent, having components derived from ethylene and an α -olefin of 6 to 20 carbon atoms, the content of the ethylene component in the range of 75 to 97% by mol, and the content of the α -olefin component in a range of 3 to 25% by mol, and an intrinsic viscosity (η) in the range of 0.2 to 5.0 dl/g, a graft component derived from a polar monomer, and the content of the polar monomer graft component in the range of 0.1 to 15% by weight along with the newly added limitation of the crystallinity of the graft copolymer as measured by X-ray

diffractionmetry of less than 30%. Nowhere do the cited references alone or in combination teach each and every one of the claimed limitations.

All Blunt teaches is colloiddally dispersible α -olefin copolymers in colloidal dispersions and only ethylene/propylene and ethylene/butene copolymers instead of the ethylene/C₆₋₂₀ copolymers of the present invention. Nothing in Blunt discloses a copolymer having the claimed ratios and properties, which result in superior adhesion strength between a coating film a metal plate. As the court stated in In re Corkill, "a greater than expected result is an evidentiary factor pertinent to the legal conclusion of [non]obviousness". 711 F.2d 1496, 266 USPQ 1005 (Fed. Cir. 1985).

Roberts et al. Tomita et al. similarly fail to teach each and every claimed limitation. Although the Office Action states that both disclose improving the properties of olefin copolymers by functionalization of a polar monomer into the copolymer, Applicants note that any possible admonition that it would have been "obvious to try" to vary the claimed limitations is improper. This is because in some cases, what would have been "obvious to try" would have been to vary all parameters or try each of numerous choices until one possibly arrived at a successful result.

Since none of the cited references gives any indication that an α -olefin of 6 to 20 carbon atoms having an ethylene component in

the range of 75 to 97% by mol, and the content of the α -olefin component in a range of 3 to 25% by mol, and an intrinsic viscosity (η) in the range of 0.2 to 5.0 dl/g, a graft component derived from a polar monomer, and the content of the polar monomer graft component in the range of 0.1 to 15% by weight along with the newly added limitation of the crystallinity of the graft copolymer as measured by X-ray diffractometry of less than 30% results in improved adhesive characteristics for ethylene copolymers, it would not have been obvious to try to make the claimed resin composition incorporating the claimed limitations. See In re O'Farrell, 853 F.2d 894, 903, U.S.P.Q.2d 1673, 1681 (Fed. Cir. 1988).

The cited references also fail to provide any suggestion or motivation to replace butene of the known compositions with higher α -olefins to improve low temperature heat sealing properties. See Table 1 of the specification at page 103. Instead, the cited references teach away from the cited references by requiring highly crystallizable copolymers. In particular, the modification process lowers the crystallinity of the claimed modified copolymers in contrast to the highly crystallizable copolymers required by the cited references.

Clearly, a *prima facie* case of obviousness has not been established. Each and every claimed limitation has not been taught and no suggestion or motivation is provided to one of ordinary

skill in the art to make the presently claimed invention. There simply was no suggestion in the prior art at the time the invention was made that the claimed limitations result in improved adhesive properties at low temperatures.

Accordingly, Applicants respectfully submit that the presently claimed invention is unobviousness over Blunt in view of either Roberts et al. or Tomita et al. and respectfully request reconsideration and withdrawal of the rejections of claims 1-14 under 35 U.S.C. §103.

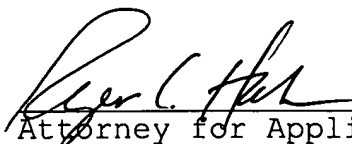
CONCLUSION

In light of the foregoing, Applicants submit that the application is now in condition for allowance. The Examiner is therefore respectfully requested to reconsider and withdraw the rejection of the pending claims and allow the pending claims. Favorable action with an early allowance of the claims pending is earnestly solicited.

Respectfully submitted,

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Attorney Docket No. ZU-392
PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:) Group Art Unit: 1733
TOKITA; SAITO) Examiner: Gallagher, John J.
Serial No. 09/601,893)
Filed: August 9, 2000)

For: **RESIN DISPERSION, METHOD OF PREPARING THE SAME,
RESIN-COATED METAL SHEET OBTAINED WITH THE SAME,
AND PROCESS FOR PRODUCING LAMINATE**

Appendix A

Please amend the claims as indicated in the following marked up copy of the claims.

1. (Once Amended) A resin dispersion comprising solid particles of a graft modified ethylene/ α -olefin random copolymer dispersed in an organic solvent, wherein the graft modified ethylene/ α -olefin random copolymer has the following properties:

(a) the copolymer contains components derived from ethylene and an α -olefin of 6 to 20 carbon atoms, the content of the ethylene component is in the range of 75 to 97% by mol, and the content of the α -olefin component is in the range of 3 to 25% by mol, each content being based on 100% by mol of the total of both components,

(b) the intrinsic viscosity (η) as measured in decalin at 135°C is in the range of 0.2 to 5.0 dl/g, [and]

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(c) the crystallinity as measured by X-ray diffractometry is less than 30%, and

[(h)] (d) the copolymer contains a graft component derived from a polar monomer, and the content of the polar monomer graft component is in the range of 0.1 to 15% by weight.

2. (Once Amended) The resin dispersion as claimed in claim 1, wherein the graft modified ethylene/ α -olefin random copolymer further has [the following properties:

(c) the] a glass transition temperature (Tg) [is] of not higher than -40°C [,

(d) the crystallinity as measured by X-ray diffractometry is less than 30%,] and

[(e) the] a molecular weight distribution (Mw/Mn) [as] measured by GPC [is] of not more than 3.

4. (Once Amended) The resin dispersion as claimed in claim 1, wherein the dispersed solid particles of the modified ethylene/ α -olefin random copolymer have particle diameters [(] measured by a Coulter Counter [)] of 1 [5] to 50 μ m.

7. (Once Amended) A process for preparing a resin dispersion, comprising grafting a polar monomer on an unmodified ethylene/ α -olefin random copolymer having the following properties:

(a') the copolymer contains components derived from ethylene and an α -olefin of 6 to 20 carbon atoms, the content of the ethylene component is in the range of 75 to 97% by mol, and the content of the α -olefin component is in the range of 3 to 25% by mol, each content being based on 100% by mol of the total of both components,

(b') the intrinsic viscosity (η) as measured in decalin at 135°C is in the range of 0.2 to 5.0 dl/g,

(c') the crystallinity as measured by X-ray diffractometry is less than 30%, and

to prepare a graft modified ethylene/ α -olefin random copolymer containing 0.1 to 15% by weight of a graft component derived from the polar monomer, and then dispersing solid particles of the graft modified copolymer in an organic solvent.

8. (Once Amended) The process for preparing a resin dispersion as claimed in claim 7, wherein the unmodified ethylene/ α -olefin random copolymer further has [the following properties:

(c') the] a glass transition temperature (T_g) [is] of not

higher than

-40°C [,

(d') the crystallinity as measured by X-ray diffractometry is less than 30%,] and

[(e') the] a molecular weight distribution (Mw/Mn) [as] measured by GPC [is] of not more than 3.

11. (Once Amended) The process for preparing a resin dispersion as claimed in claim 7 [4], wherein the resin dispersion [of claim 1 is prepared] comprises a polar monomer grafted to an unmodified ethylene/α-olefin random copolymer having the following properties:

(a') the copolymer contains components derived from ethylene and an α-olefin of 6 to 20 carbon atoms, the content of the ethylene component is in the range of 75 to 97% by mol, and the content of the α-olefin component is in the range of 3 to 25% by mol, each content being based on 100% by mol of the total of both components,

(b') the intrinsic viscosity (η) as measured in decalin at 135°C is in the range of 0.2 to 5.0 dl/g,

(c') the crystallinity as measured by X-ray diffractometry is less than 30%, and

to prepare a graft modified ethylene/α-olefin random copolymer

containing 0.1 to 15% by weight of a graft component derived from the polar monomer, and then dispersing solid particles of the graft modified copolymer in an organic solvent.



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RESIN-COATED METAL SHEET OBTAINED WITH THE SAME,
AND PROCESS FOR PRODUCING LAMINATE**

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Appendix B

Please amend the claims as indicated in the following clean copy of the amended claims.

a1 sub B7 1. (Once Amended) A resin dispersion comprising solid particles of a graft modified ethylene/ α -olefin random copolymer dispersed in an organic solvent, wherein the graft modified ethylene/ α -olefin random copolymer has the following properties:

(a) the copolymer contains components derived from ethylene and an α -olefin of 6 to 20 carbon atoms, the content of the ethylene component is in the range of 75 to 97% by mol, and the content of the α -olefin component is in the range of 3 to 25% by mol, each content being based on 100% by mol of the total of both components,

(b) the intrinsic viscosity (η) as measured in decalin at 135°C is in the range of 0.2 to 5.0 dl/g,

(c) the crystallinity as measured by X-ray diffractometry is less than 30%, and

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Q1 (d) the copolymer contains a graft component derived from a polar monomer, and the content of the polar monomer graft component is in the range of 0.1 to 15% by weight.

Q2 2. (Once Amended) The resin dispersion as claimed in claim 1, wherein the graft modified ethylene/ α -olefin random copolymer further has a glass transition temperature (T_g) of not higher than -40°C and a molecular weight distribution (M_w/M_n) measured by GPC of not more than 3.

Q2 4. (Once Amended) The resin dispersion as claimed in claim 1, wherein the dispersed solid particles of the modified ethylene/ α -olefin random copolymer have particle diameters measured by a Coulter Counter of 1 to 50 μm .

Q3 501
Q3 1. (Once Amended) A process for preparing a resin dispersion, comprising grafting a polar monomer on an unmodified ethylene/ α -olefin random copolymer having the following properties:

(a') the copolymer contains components derived from ethylene and an α -olefin of 6 to 20 carbon atoms, the content of the ethylene component is in the range of 75 to 97% by mol, and the

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content of the α -olefin component is in the range of 3 to 25% by mol, each content being based on 100% by mol of the total of both components,

A3 (b') the intrinsic viscosity (η) as measured in decalin at 135°C is in the range of 0.2 to 5.0 dl/g,

(c') the crystallinity as measured by X-ray diffractometry is less than 30%, and

to prepare a graft modified ethylene/ α -olefin random copolymer containing 0.1 to 15% by weight of a graft component derived from the polar monomer, and then dispersing solid particles of the graft modified copolymer in an organic solvent.

8. (Once Amended) The process for preparing a resin dispersion as claimed in claim 7, wherein the unmodified ethylene/ α -olefin random copolymer further has a glass transition temperature (T_g) of not higher than -40°C and a molecular weight distribution (M_w/M_n) measured by GPC of not more than 3.

A4 11. (Once Amended) The process for preparing a resin dispersion as claimed in claim 7, wherein the resin dispersion comprises a polar monomer grafted to an unmodified ethylene/ α -olefin random copolymer having the following properties:

(a') the copolymer contains components derived from ethylene

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ay and an α -olefin of 6 to 20 carbon atoms, the content of the ethylene component is in the range of 75 to 97% by mol, and the content of the α -olefin component is in the range of 3 to 25% by mol, each content being based on 100% by mol of the total of both components,

(b') the intrinsic viscosity (η) as measured in decalin at 135°C is in the range of 0.2 to 5.0 dl/g,

(c') the crystallinity as measured by X-ray diffractometry is less than 30%, and

to prepare a graft modified ethylene/ α -olefin random copolymer containing 0.1 to 15% by weight of a graft component derived from the polar monomer, and then dispersing solid particles of the graft modified copolymer in an organic solvent.